[0029]   ~~Fig. 1 is a view~~Figs. 1(a), 1(b), 1(c) and 1(d) are views for showing the principle of halftone phase shifting lithography.

[0030]   ~~Fig. 2 is a view~~Figs. 2(a), 2(b), 2(c) and 2(d) are views for showing conventional lithography against Fig. 1.

[0033]   ~~Fig. 5 is a view~~Figs. 5(a) and 5(b) are views for showing a state in which phase difference and transmittance are changed by applying excimer laser to a halftone phase shifting photomask having the halftone phase shifting film containing chromium and fluorine.

[0035]   ~~Fig. 7 is a view~~Figs. 7(a) and 7(b) are views for showing that the spectrum analyzed from reflectance of X-rays (of after Fourier transform) is changed by applying excimer laser to a halftone phase shifting photomask having the halftone phase shifting film containing chromium and fluorine, in which Fig. 7(a) shows the spectrum analyzed from reflectance of X-rays of before the applying of excimer laser to the halftone phase shifting photomask, and Fig. 7(b) shows the spectrum analyzed from reflectance of X-rays of after the applying of excimer laser to the halftone phase shifting photomask.

[0036]   ~~Fig. 8 is a view~~Figs. 8(a), 8(b), 8(c) 8(d) and 8(e) are views for illustrating the processes in which blanks for halftone phase shifting photomask are produced and then a halftone phase shifting photomask of example 1 is obtained by processing the blanks for halftone phase shifting photomask.

[0038]   ~~Fig. 10 is a view~~Figs. 10(a), 10(b), 10(c) and
10(d) are views for illustrating the process for producing a
halftone phase shifting photomask of Example 2.

[0039]   ~~Fig. 11 is a view~~Figs. 11(a) and 11(b) are views
for showing the phase difference change and the
transmittance change due to applying excimer laser to a
halftone phase shifting photomask having halftone phase
shifting film of Example 1.

[0040]   ~~Fig.12 is a view~~Figs. 12(a) and 12(b) are views
for showing the phase difference change and the
transmittance change due to applying excimer laser to a
halftone phase shifting photomask having halftone phase
shifting film of Example 4.

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[0029]   Figs. 1(a), 1(b), 1(c) and 1(d) are views for showing the principle of halftone phase shifting lithography.

[0030]   Figs. 2(a), 2(b), 2(c) and 2(d) are views for showing conventional lithography against Fig. 1.

[0033]   Figs. 5(a) and 5(b) are views for showing a state in which phase difference and transmittance are changed by applying excimer laser to a halftone phase shifting photomask having the halftone phase shifting film containing chromium and fluorine.

[0035]   Figs. 7(a) and 7(b) are views for showing that the spectrum analyzed from reflectance of X-rays (of after Fourier transform) is changed by applying excimer laser to a halftone phase shifting photomask having the halftone phase shifting film containing chromium and fluorine, in which Fig. 7(a) shows the spectrum analyzed from reflectance of X-rays of before the applying of excimer laser to the halftone phase shifting photomask, and Fig. 7(b) shows the spectrum analyzed from reflectance of X-rays of after the applying of excimer laser to the halftone phase shifting photomask.

[0036]   Figs. 8(a), 8(b), 8(c) 8(d) and 8(e) are views for illustrating the processes in which blanks for halftone phase shifting photomask are produced and then a halftone phase shifting photomask of example 1 is obtained by processing the blanks for halftone phase shifting photomask.

[0038]   Figs. 10(a), 10(b), 10(c) and 10(d) are views for illustrating the process for producing a halftone phase shifting photomask of Example 2.

[0039]   Figs. 11(a) and 11(b) are views for showing the phase difference change and the transmittance change due to applying excimer laser to a halftone phase shifting photomask having halftone phase shifting film of Example 1.

[0040]   Figs. 12(a) and 12(b) are views for showing the phase difference change and the transmittance change due to applying excimer laser to a halftone phase shifting photomask having halftone phase shifting film of Example 4.